Introduction

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Physical and chemical techniques have recently become increasingly important in precision engineering. For example, just as chemistry has become indispensable in biology, the important techniques of microminiaturization cannot be achieved without the aid of physical and chemical sciences. Techniques for the manufacture of integrated circuits and the shaping of small components from modern materials similarly cannot be carried out without drawing on physical and chemical techniques.

The first two chapters, therefore, deal with some of the most important methods involved in microminiaturization. Modern techniques and new applications developed from existing working methods are also described here.

There are certain traditional methods in chemical technology that are of particular importance in relation to precision engineering. The coating of components with organic and inorganic materials for corrosion resistance or ornamentation is a technique which, in spite of its long history, is still being developed in new directions, primarily with a view to mechanization. Since it is desirable that the designer and manufacturer should be aware of these developments a number of chapters review the available processes.

In electronics, printed circuits are being rapidly developed and are finding increasing application. The methods of their manufacture and the problems that can arise with such circuits are described in detail in a separate chapter.

Etching techniques are at present being used extensively, both in the manufacture of components and the provision of instrumentation for laboratories and industries. A chapter is, therefore, included which deals with the various methods available and their applications.

It is not the aim of this book to cater purely for those actively engaged in the specialized techniques described in the text. For this purpose there are numerous more specialized works as well as articles in scientific and technical journals. It is hoped, however, that this work will be of wider general interest to all those involved in the design and manufacture of precision components.

The units used throughout the text are those recommended by the I.S.O., as described in Chapter 1 of the first volume in the series.